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THE

# ART OF MODELLING IN CLAY AND WAX.

ARRANGED AS A COURSE OF INSTRUCTION  
PREPARATORY TO THE EXAMINATIONS OF THE  
DEPARTMENT OF SCIENCE AND ART.

---

BY THOS. C. SIMMONDS.

(Head Master Derby School of Art and Technical Institution.)

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With Numerous Illustrations by the Author.



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TO THE EXAMINATIONS OF THE SCIENCE AND  
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By Thomas C. Simmonds

(*Head Master Derby School of Art and Technical Institution*).

WITH NUMEROUS ILLUSTRATIONS BY THE AUTHOR.

LONDON: Bemrose & Sons, Limited, 23, Old Bailey; and Derby.

# Margaret Barron

*(Late Teacher and Lecturer of the Derby County Council).*

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## P R E F A C E .

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THE interest aroused in the matter of Technical Education has, necessarily, brought modelling in clay into a prominent position as an educational factor. By no other means can persons be so readily taught the dexterous use of their fingers at so early an age, or at so small a cost, as by elementary modelling, in a plastic material. It is the most direct and simple method of acquiring a due sense of form and proportion. As it deals with the *third dimension*, that is projection, as well as length and breadth, it has a greater influence in developing an appreciation of form than even drawing, as, in the latter art, the work is confined to a single plane. That the desire for instruction in this subject is rapidly spreading, is proved by the returns of the Science and Art Department, showing the rapidly increasing number coming forward to the examinations. Although

written instructions can never supersede direct personal teaching, still the writer believes that the course laid down in this work will enable any painstaking and intelligent student to acquire, not only a mastery of the elementary portion of the subject, sufficient for the second grade examination, but also to advance to much more complete work, while to the teacher it will provide a text book that will lessen his labours and assist his pupils.

THOS. C. SIMMONDS.

*Derby School of Art, 1892.*

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# THE ART OF MODELLING IN CLAY AND WAX.

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## CHAPTER I.

### INTRODUCTION.

THE art of Modelling is of great antiquity. The making of forms in wet earth would naturally suggest itself to the mind of man at a very early stage in the history of the race. Although this work is not intended to be historical, it may be desirable to refer to the references in Scripture to the making of images, and to the numbers of small objects in baked clay which had their origin in the East and in Egypt three or four thousand years ago. Many cinerary urns of the Etruscan period afford illustrations of Modelling, more or less complete, while the potter's wheel illustrated on ancient monuments, shows that in those remote times one of the best ways of dealing with plastic material was fully understood.

The "*wheel*" to give the forms, and the ornament "*modelled*" and "*applied*," would naturally precede the moulding process so commonly resorted to now-a-days. The ancients being acquainted with modelling in clay from the most primitive times, it would follow naturally that, as the

craftsmen advanced, and desired to "emulate in stone," bronze, and other materials, they would "sketch" or develop their original ideas in the more manageable and highly tractable clay. Modelling in clay thus became the hand-maid of sculpture, and so remains to the present day. All the works that claim our admiration in marble, in bronze, or other metals, come first from the brain of the artist in the simple clay. In the clay stage they reach their highest art, and it is lucky if they lose *nothing* in their translation into the more lasting and costly material.

That the clay lends itself so quickly and readily to the expression of ideas, and permits of constant alterations, even of a radical character, without any injury whatever, is the cause of its universal adoption as a medium for designing in the "*round*."

The first part of this work is devoted to the elementary ornamental forms used by the Science and Art Department in the examination of the second grade, and that section should be sufficient preparation for that examination.

But, believing that many students will feel the fascination that modelling exerts, and desire to continue the study, induced the author to carry the subject much further; adding modelling foliage and natural forms, and those of the human figure. Although it was not possible within the limits of this work to go deeply into the latter portion, still, at the same time, sufficient has been said to enable those with an aptitude for the subject, especially if imbued with a little mechanical skill, to pursue the study successfully to higher fields, even without personal instruction.

CHAPTER II.

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## MODELLING.—THE MATERIALS.

THE material mostly employed for modelling is clay specially prepared for the purpose. It must be perfectly plastic, homogeneous, and free from grit. It is prepared by grinding in a mill till these requisite conditions are fulfilled. It may be obtained from most pottery works, at about eight shillings per hundredweight. The proper preservation of the clay in storage is a matter of importance. It must not be allowed to get dry, or it will crack, and eventually break up into very hard lumps. It would involve much labour before it could again be made fit for use. With proper management the waste is small, as the same clay can be used over and over again for various models. In small quantities it can be kept in any earthenware vessel that will hold water. For a larger quantity the most convenient receptacle is a wooden box lined with zinc, soldered so as to be water tight. Such a box is shown in Fig. I. It is 2 ft. square, and 2 ft. 6 in. high, and is rendered watertight by a zinc lining, well soldered at all the joints. This box will conveniently hold two to three cwts. In the case of large classes and more advanced work requiring large quantities of clay, it is best to build a tank outside

FIG. I.

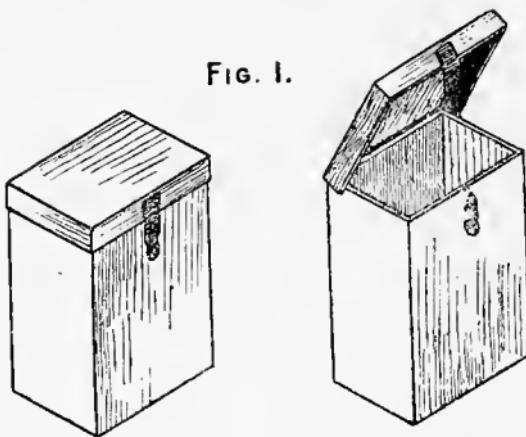
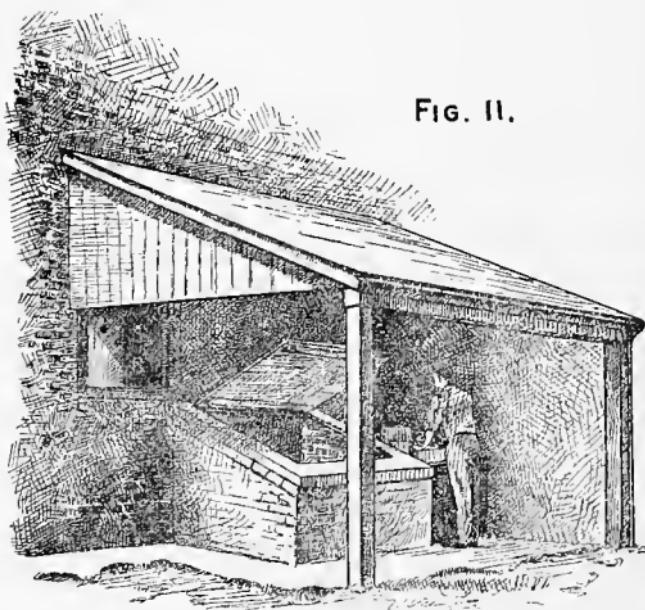


FIG. II.



the modelling room, preferably on the north side. This tank should be built in blue brick, not less than nine inches thick, laid in cement. The bottom must be similar brick-work, or sound concrete, the object being to prevent any leakage that would have a drying effect upon the clay. The illustration (Fig. II.) shows such an arrangement in use at the Derby School of Art.

The tank, which will hold about two tons of clay, is shut in by means of a strong lid. The lid can be raised upwards, and drawn backwards by a cord which passes over a pulley above. At the side of the tank is a "banker," built of brick, with a stone top, upon which clay taken from the tank can be beaten and wedged up ready for use. The whole is covered by a lean-to roof to protect it from the weather. At the back an opening with a sliding door affords means for passing the clay into the modelling room.

Although, as previously stated, clay is the material generally used in modelling, there are other substances which are, under certain conditions, more convenient in use, or are more suitable for special work. The greatest disadvantage in clay is the necessity for keeping it damp, and the consequent impossibility of permanently preserving the model when finished, in its simple clay state, without having recourse to any after process. For any fine and small work in modelling, a preparation of beeswax, sold by artists' colourmen as "*modelling wax*," is much used. It can be had in various colours, similar to terra-cotta or bronze.

It is rendered soft by warming, and becomes quite hard when cold. The model in wax may be put away during progress for any length of time, and requires no attention.

After completion, the model will, with ordinary care, last indefinitely.

In Paris a material called "*Pâte Plastique*" is largely used by modellers and sculptors. It is coloured like terra-cotta, bronze, or grey, or plain black. It is excellent to work, very clean to the fingers, and possesses all the advantages of wax at less cost. This material can be obtained in London of the dealers in art requisites.

## CHAPTER III.

## THE TOOLS AND APPARATUS.

THE tools required are very few and simple, as nature provides those that are most efficient, and principally used, viz., the fingers. Still, for certain purposes *tools* are necessary.

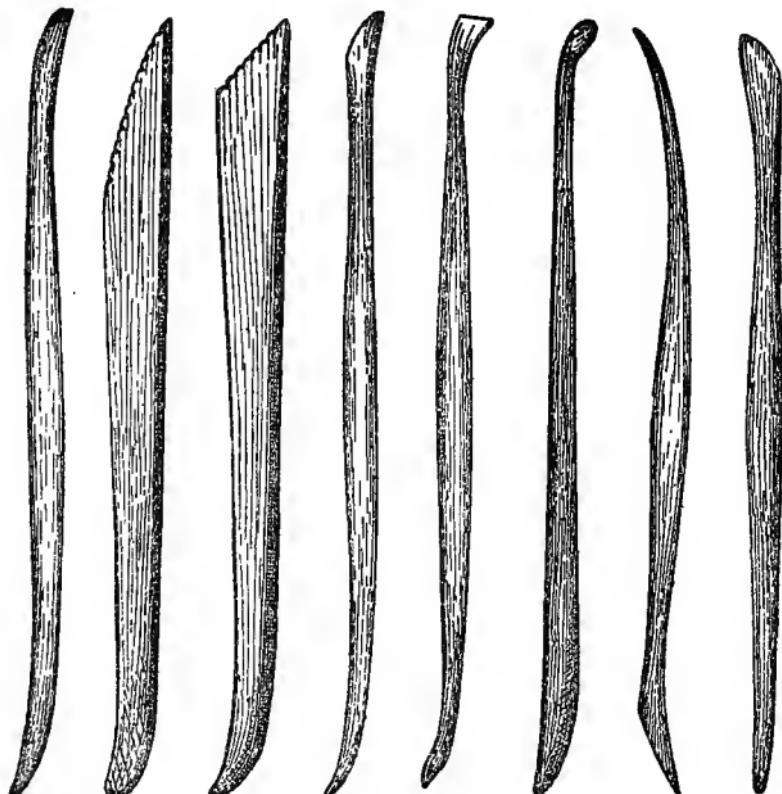


FIG. III.

MODELLING TOOLS.—These are usually made in *box-wood*, of various forms, among which those illustrated (Fig. III.) are the most useful. No matter what the form, they are simply defined as “*modelling tools*.”

Fine bone is also employed for making tools, but these are similar in other respects to the box-wood tools, and are not so generally used as the latter, except in minute work.



FIG. IV.



Wire on a wooden handle, serrated or otherwise, is also a useful tool for some purposes. Fig. IV. illustrates this tool.

STEEL TOOLS for cleaning out and cutting plaster, are required in moulding from the clay, but are not necessary in modelling.

STEEL RASPS are also required occasionally, when the models are produced in plaster.

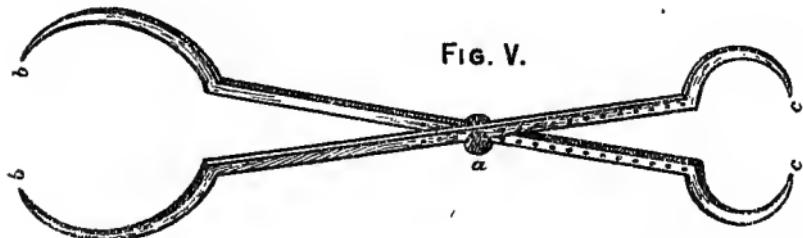


FIG. V.

HARD WOOD CALLIPERS for enlarging and reducing, see Fig. V. These are best made with a movable centre, so

that the *proportion* between the points at the minor end, *a*, can be altered as regards the major end, *b*.

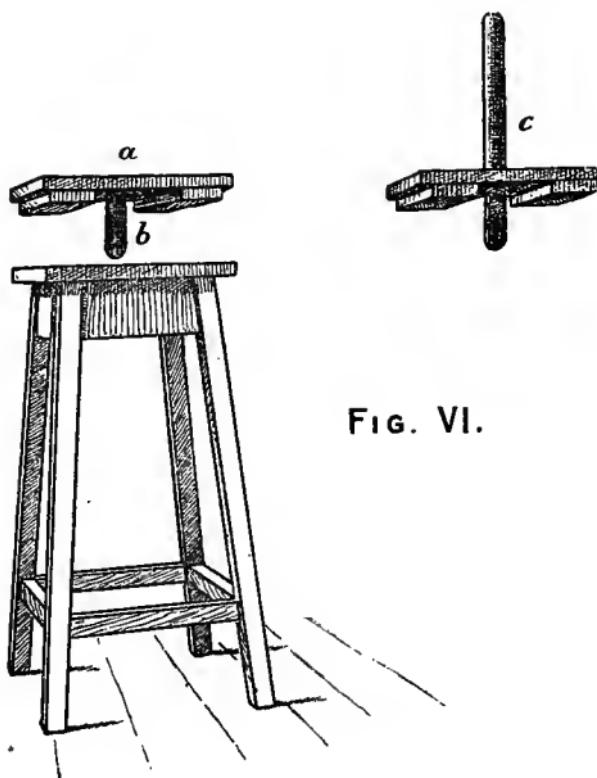
**MODELLING BOARD.**—In the case of all work such as ornament, medallions, etc., which are intended to be seen from one side only, that is, not completely in the round like a statue, a flat board like a drawing board, called a *modelling board* is employed to model upon, or a substitute in another material takes its place. For ordinary work a good substitute is a common slate, as used in elementary schools. It should be of considerable size, say 22 in. by 15 in. On such slates the modelling clay or *pâte plastique* will readily adhere, holding better than it will on wood, unless special provision be made for keeping it on the latter.

Slabs cast in plaster of Paris are also employed, but these require preparation to prevent absorption, or the clay slips off. They are also open to the objection that they are very readily broken, and in work will probably prove the most expensive form of modelling slab.

For classes the common slate is certainly the most convenient; and at the same time the cheapest material to work upon.

**THE STAND.**—It is necessary to have some means of supporting the modelling board when in use, and of placing the object, cast, or design, to be modelled in a convenient position to see while working. For these purposes there are many arrangements, but the following types have the general characteristics of all, and are convenient in form.

**THE STAND (Fig. VI.)** is a square stool about 3 ft. 6 in. high, and 16 in. square at the top. It may be made in hard wood, or in red deal, painted. It is desirable that it should



be provided with a movable top as shown in Fig. VI., *a*. This square top is provided with a circular wooden pin, *b*, which passes through a corresponding hole in the centre of the top of the stool. When this pin is placed in the hole, it enables the movable top to be revolved on this centre so as to present to the student any part of the model it may be desired to examine or work upon. If a wooden upright be fixed firmly in the revolving top as at *c*, it affords a support to a mass of clay such as would be required in modelling a bust in the round. To make the revolving parts work readily, plumbago with a very little oil should be rubbed on the portions in contact. The stand is sometimes made with



FIG. VII.

circular top, the support consisting of three legs, as Fig. VII. It is better to avoid all stands where a screw is employed for elevating or lowering—if made in wood it will probably swell with the moisture which will sooner or later reach it, or if in iron it will rust.

**SUPPORT FOR BAS-RELIEF.**—It has already been explained that a modelling board is employed for modelling upon, but this requires to be kept nearly upright in front of the Student when in work, and necessitates some form of support. A useful support is illustrated in Fig. VIII.

It may be placed on the stand previously described, with slate or modelling board put against it leaning back, and the clay in use on the shelf at the bottom, while the small cast or drawing may be hung by the side of the work. It will be seen that such a support can be placed upon any ordinary table, and that the shelf will prevent small bits of clay



FIG. VIII.

falling about to soil the floor or other surroundings. If a small hook (Fig. IX.) be provided just wide enough at *a* to clip the top of the support, it will form a ready means of hanging a cast or other model.

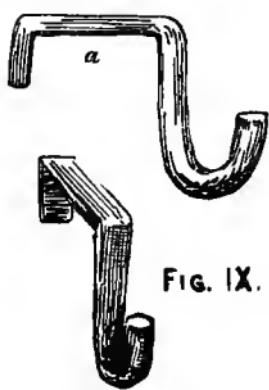
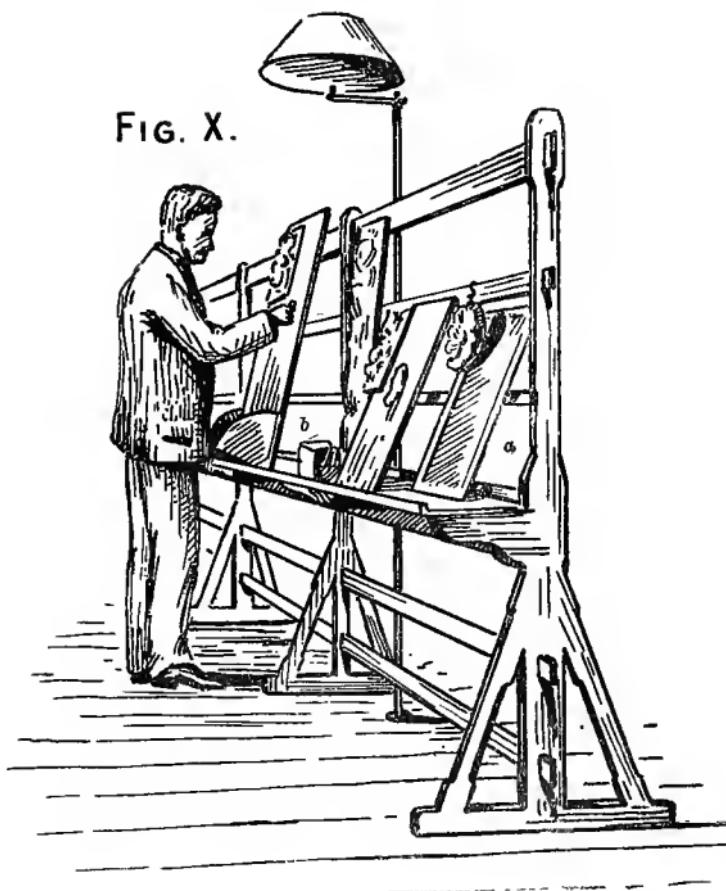


FIG. IX.

If provision has to be made for an elementary class, a continuous stand will answer every purpose, and be more economical. Such a stand is illustrated in Fig. X. It will support a simple modelling board or slate as shown at *a*, or one provided with a shelf as at *b*. The construction shown will be found perfectly stable, even with a number of students working

FIG. X.



at it. The expense would be further reduced, in the case of a limited number of students, by fixing a shelf to a wall to form a table.

**CASTS.**—The best models to commence from are undoubtedly casts. These are used for the test in the Second Grade Examination in modelling under the Science and Art Department. The casts selected are supplied by Messrs. Brucani & Co.

The following is the list from the syllabus of the examination :—

- No. 344. Rosette..
- „ 345. Do.
- „ 346. Do.
- „ 2315. Elementary Ornament.
- „ 494*a*. Rosette.
- „ 494*b*. Do.
- „ 1542. Pilaster.
- „ 1543. Do.
- „ 476*a*. Do.
- „ 476*b*. Do.
- „ 478. Madeleine Pilaster (or Section of it).
- „ 1641. Panel.

For more advanced study the same firm supplies numerous casts, of which a catalogue can be obtained.

In addition to casts, various fruits and foliage can be used as models for imitation, and afford an opportunity for occasional variety in the study, which is welcome to most students.

## CHAPTER IV.

## EXERCISE I.

**I**N commencing the study of modelling in clay, it is essential to success that the student should have a clear and definite idea of the object to aim at, and the best methods of work to obtain the desired end. Although so intimately associated with sculpture, in fact the basis of that art, for the sculptor not only *sketches* his first ideas in *clay*, but also realizes the complete work and carries it to the utmost perfection in that material, before it is put into marble or bronze, still, in the method of working, it is the direct opposite. Aristotle said: "The figure is in the marble before the sculptor touches it, he only removes the superfluous material." This statement is a true description of the process of carving, which consists in cutting away that which is not required, and of leaving the desired forms intact; but when we come to modelling, these forms are gradually built up, and no carving or scraping is resorted to, except as a correction of an error, or at the most to give texture and character.

This point cannot be too much insisted upon, as the right *handling* of the clay is conducive to success.

Fig. XI. is a good Model to commence with. It is No.  $\frac{2315}{9}$  of the series recommended for elementary study.

Place the cast on a level with the eye, and *model* on the same level, to the right hand of it. The best method of hanging it has already been explained in Chapter III.

It is important that both the cast and the *model* be so placed that they can be viewed conveniently at the same time from very similar positions, so as to permit of constant

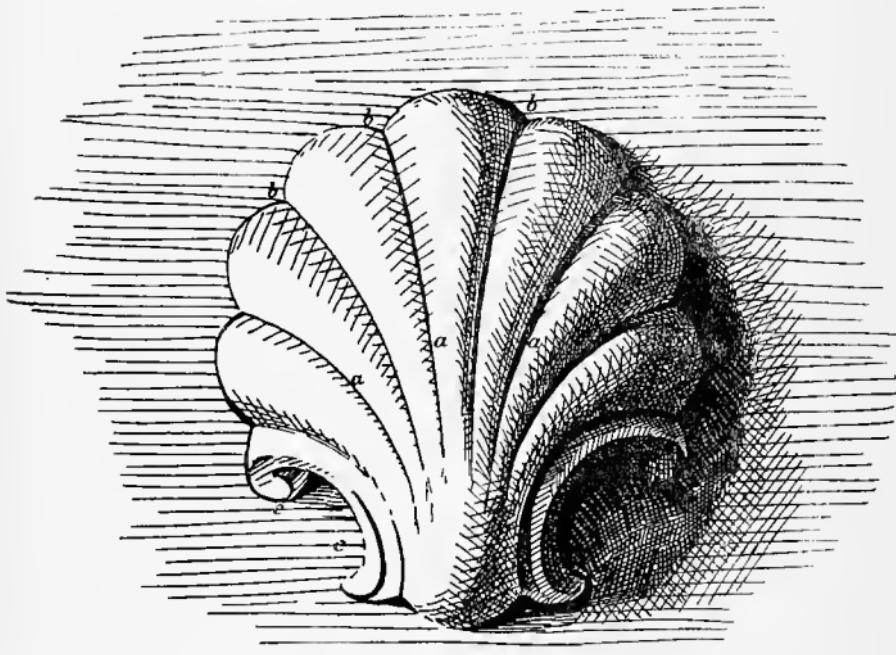


FIG. XI.

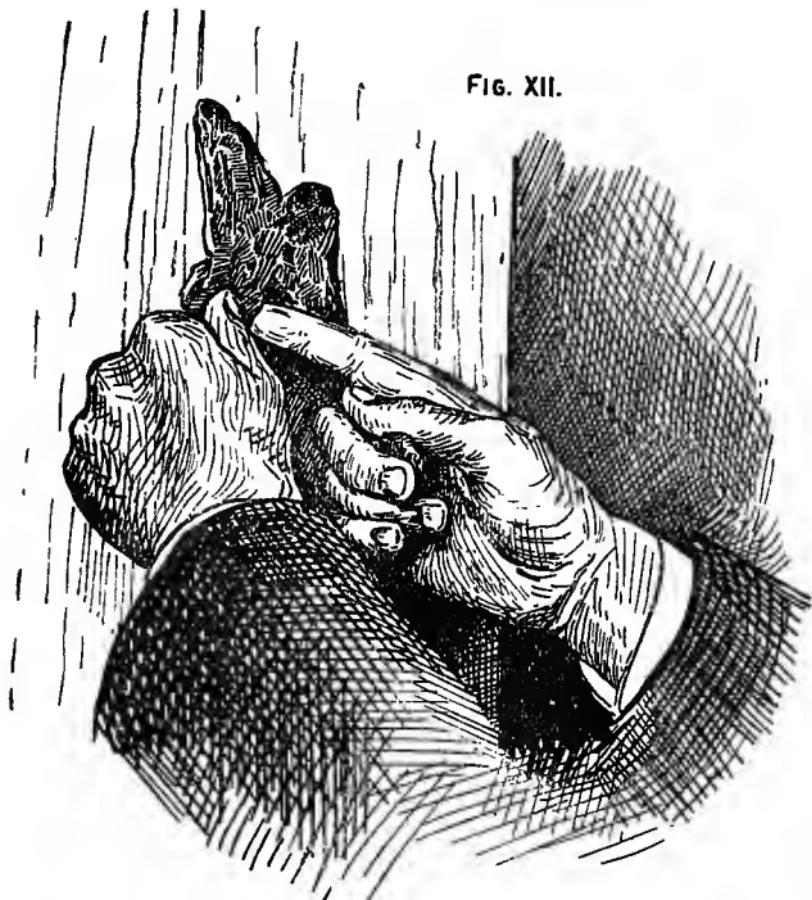
comparisons. This not only refers to the front view, but what is equally as important, the *profile*, to enable the modeller to estimate the amount of projection above the slab or background. It must be understood that the illustration Fig. XI. is merely introduced in the way of explanation, and is not intended to be copied. At this stage

of the study the work must be entirely done from the cast. Later on, modelling should also be practised from drawings and photographs, but this requires much more experience to appreciate the effect produced by the amount of projection, and is totally unfit as early study.

Commence by drawing upon the *modelling board* or slate an outline of the cast, which is in this case a *shell form*, as usual in Renaissance ornament. It should be ~~+~~ modelled larger than the original. It need not be much larger, say about an inch longer, and, of course, all parts increased in proportion. The outline drawing should be made with accuracy, paying attention to the proper radiation of the lines *a, a*, from the centre. It is assumed that a knowledge of the elementary principles of ornament, and the power to apply the same in simple drawing, are possessed by the student. When the drawing is correct in proportion, and the leading lines are indicated, the modelling may be commenced, as it would be useless to carry the drawing farther or to add any of the smaller details. Place sufficient *modelling clay* on the stand ready to hand. Break off a piece, say, about as large as a walnut, and pressing it between the fingers and thumb of the right hand, place it upon the modelling board inside the outline of the form to be modelled. Press it down *firmly* on to the *board* or *slate*, so as to make it adhere and be thoroughly solid. Then take another piece and put that on in a similar manner, and continue the process till all the portion within the outlines is covered with a layer of clay firmly adhering to the slate. The slab on which the shell lies in the cast is represented by the slate, so that no clay has to be used outside the outline of the shell. While fixing on the clay, frequently look

at the work *from the side*, and note whether the clay is being raised to the same "height or projection" as the corresponding portion of the cast. Work very largely with the thumb, as shown in Fig. XII., and while endeavouring to get the

FIG. XII.



form in this way, be careful also to press the clay down very firmly, so as to make the model quite solid. Next take smaller pieces of clay, say about the size of a nut, and apply these exactly as before, on those parts which are not sufficiently

raised from the slab. An intelligent student will soon comprehend the intention of these instructions if he will only *model* as directed step by step. He will see that there is no rule about the size of a piece of clay to apply at a time, but that the sizes mentioned are the most convenient for the work in hand, and he will soon adjust the "bits" put on to the necessities of the case. If the elevation is found too small, he must estimate how much, and apply such a piece as he thinks will raise it to the proper height. While *building* up the *model* in this way, only the *fingers* must be used, and no tools brought into requisition. As the model approaches the proper size and elevation, endeavour to *draw* in the forms, using the *fingers*, and more especially the *thumb*, for the purpose. Constantly look at the model and the cast from various points of view, and compare the forms, remembering always to look from the side so as to judge of the "*third dimension*," that is, the height raised above the slate.

At this stage it may be convenient to terminate the lesson, and it will, therefore, be necessary to consider the provision that will have to be made for the proper keeping of the clay model till such times as the work can be resumed. As the student is already aware, the clay, if exposed to the drying influence of the atmosphere of a room, would quickly become too hard to work or model under the pressure of the fingers, and would finally break up and tumble off the slate. To prevent this, take a cloth and dip it in water so as to thoroughly wet it. Then wring all the surplus water out of it, and place it over the model. This will keep the model in proper condition for 24 hours, but if it be not intended to work upon it then, the cloth must be taken off and damped

again in a similar manner. Common sense will dictate the necessary care in neither allowing the clay to become dry, or on the other hand, to saturate it with water. There must be no shirking of the modicum of trouble involved in maintaining the model in a proper condition. Once allowed to completely harden, it must be broken up, as any attempt to soften it by a liberal allowance of water on its surface would destroy all the modelling, and reduce it to a meaningless lump of clay. Lazy people *have* been known to place the slate in a horizontal position, and do the damping by means of a watering can, applying the water over the top of the cloth without removing it. If the model be hopelessly bad, a less *roundabout* method of destruction may be employed; if the model possess merit, it is worthy of more kindly care.

Common unbleached calico is a suitable material for the cloths.

It will be found that as the model approaches completion, and the additions or alterations become more minute, it is better to allow the clay to become slightly drier, but not sufficiently so as to lose its plastic state.

On resuming the study, remove the wet cloth and carefully examine the model. On looking at it again with a fresh eye, it is probable that defects not noticed before will now be evident. Where necessary, *scrape* away with the wire tool (Fig. IV.), and where too low, raise by adding, as before, small bits of clay. The student should now have by him a damp sponge, lying in a small bowl of earthenware or glass, upon which he can moisten his fingers and prevent the clay hardening upon them. Moisten the fingers and thumb, and apply small quantities of clay, endeavouring to

model the forms as like the cast as possible. When too much clay has been put on it can be reduced by a box-wood tool with fine teeth, as Fig. III., *a*, but try to avoid as much as possible the necessity for this work, and only build up to the extent required. Do not forget to press all down as solid as possible, not leaving holes in the body of the Model, or great trouble will result. *Draw* the forms as well as you can with the thumb, and prevent any lumps forming in them where none are shown in the cast.

Your critical examination must now be more severe, looking first in front of the model and then from the side, and scraping away or adding to as your judgment decides.

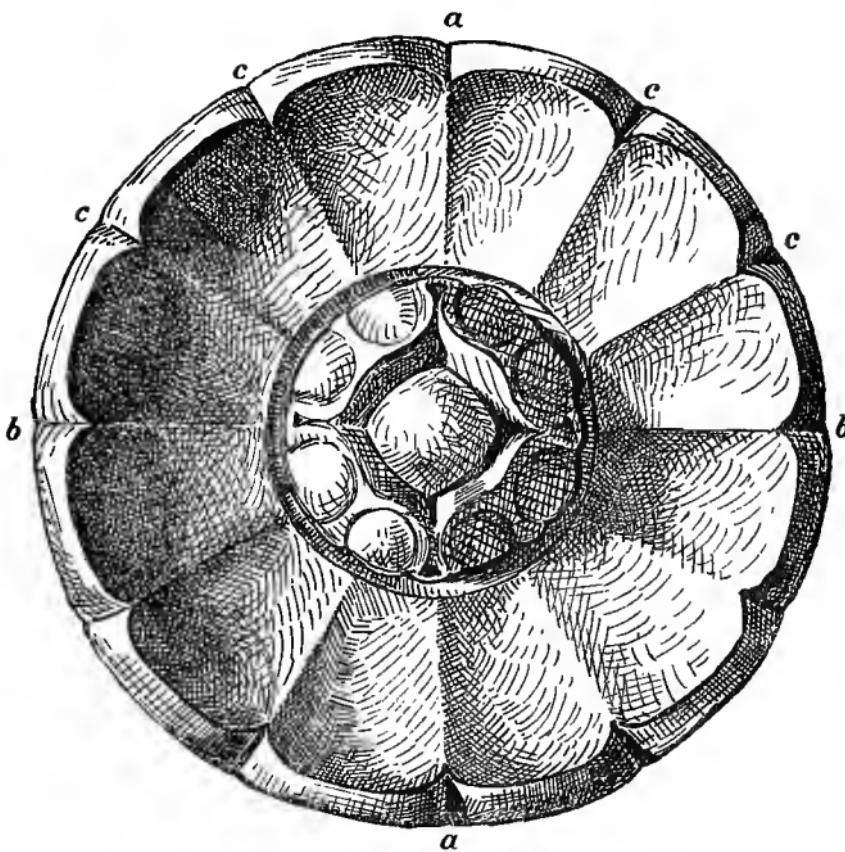
At this stage you may have to discontinue your lesson. If so, wash out the cloth, and having wrung it out as before, wrap up the Model with care. Take also those tools which have been used, and wash all clay off them. Wash the sponge and its basin, and return the unused clay to the box or tank, or it will become unworkable. This cleanliness is essential to good work, for if not attended to, the hard dry bits of clay would become attached to the Model, and disagreeable lumps would result.

On again resuming the study it should be easy to complete the work. The *callipers* may be set to the size, and the various parts tested by actual measurement with the cast. Never under any circumstances commence by using the compasses. Always estimate the size and amount of projection of the various parts by the eye, and afterwards test the accuracy by the mechanical aids of the rule or compass. This is important, as experience proves that if measurements are first resorted to, the power of the eye is not cultivated, and remains quite unable to accurately

estimate spaces ; while, on the other hand, if an endeavour be made to compare sizes by means of the eye, and then to mark off what is believed to be the amount, afterwards testing by measurement, the error, if there be one, will, when shown in this way, serve to educate the eye and enable a more accurate judgment to be formed next time. As regards the model in hand, if any inaccuracies be found, the clay must be scraped away by means of one of the serrated tools, or built up by the addition of more clay, as the case may require. When correct in all these general proportions, it only remains to refine the surface modelling, and to draw the edges clean and true in form, and complete the *undercutting*. Now take a fine tool and *draw* firmly and accurately the radiating lines *a, a, a*, cleaning out the clay so that the round form of one lobe may finish neatly against that of the next. Draw these lines with the proper radiation as though all coming away from one centre ; in other words, note that if continued downwards they would all come together near the same point in a tangential manner. If correctly done, the clay between these furrows will *gradually widen* upwards. Use a tool also to finish neatly the rounded tops against the background, and to get clean corners at *b, b*. A tool will also be required to finish and to *scrape* away the part which is slightly undercut, viz., at *c, c*. When this is complete, the Model should bear a very near resemblance to the cast, and may be considered finished.

## EXERCISE II.

FIG. XIII.



This cast is No.  $\frac{2315}{10}$  of the same series of elementary ornament. It is a *rosette* or *patera*. Commence by drawing a circle of the requisite size to enclose the entire ornament. Draw vertical and horizontal diameters, *a*, *a*, *b*, *b*. The radius of the circle marked off on the circumference from the ends of these diameters at *c*, *c*, will

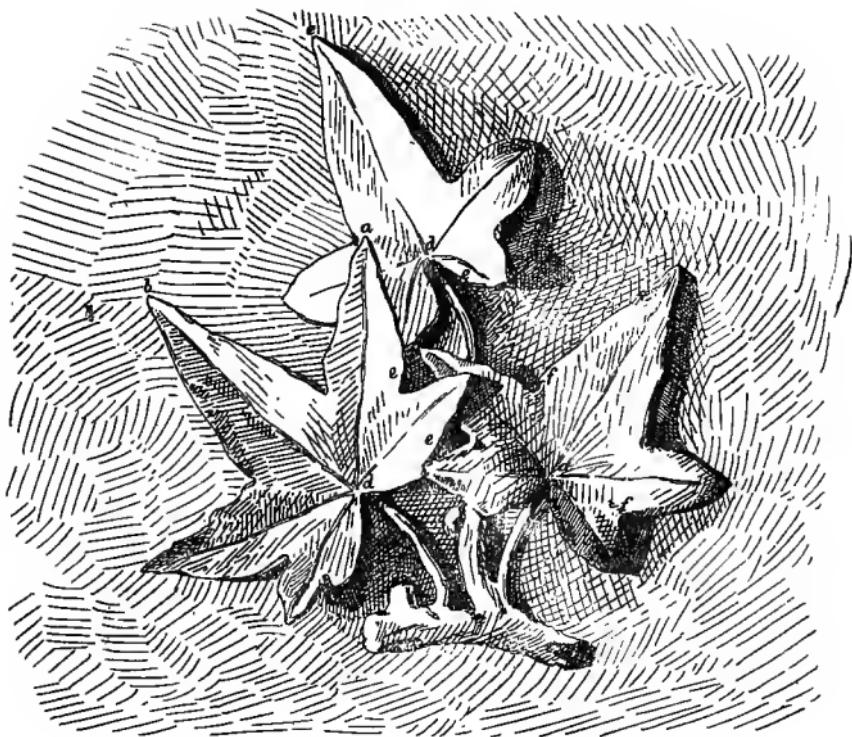
give the other divisions and lines joining these, and passing through the centre will give the twelve sections into which the rosette is divided. Draw the smaller circle, enclosing the central portion of the ornament. This is all the drawing which will be of service. Before beginning to model, *slightly* damp the slate. Hang the cast by the side of, and level with the drawing, as in the last exercise. Take up small pieces of clay, and build up the central part, which is the portion most in relief. Follow on with the lobes of the rosette, noticing that they are not much raised above the background in the lower parts of them, not more than about  $\frac{1}{8}$  of an inch. Towards the outside, that is at the boundary circle, they rise to a considerable height, but still not so high as the central point of the figure by perhaps a quarter of an inch. Build up the clay to describe these forms, using the fingers, and more especially the *thumb*. It must not be forgotten to well press down the clay, and to keep it perfectly solid. Notice the concave form of the surfaces forming the lobes, and keep the boundary lines between them straight, and pointing truly to the centre of the figure. As experience is gained it will be found that more and more can be described by the *drawing* with the thumb, and that the clay much more readily assumes the desired form. It is probable, therefore, that by this time the student has a fair model in the rough of the cast, and, if so, it will be convenient to allow it time to very slightly harden before finishing. Wring out the cloth as dry as possible, and cover up as before described.

On again resuming the work the model must be very critically examined. Faults will probably strike a fresh eye which escaped attention in the last lesson. These must be

corrected, scraping away where necessary, and adding small pieces of clay where there appears a deficiency. Special attention should be paid to the lines dividing the different lobes, to see that they are straight and radiating from the centre, those on one side corresponding to those on the other. If all these particulars be found correct, the necessary finish can now be got by means of the tools. The joints between the lobes at *a*, *b*, *c*, must be made neat and clean, with a fine tool. In the centre of the figure the sharp point of a tool will be required, to give the separation between the round form and the four leaves which surround it, and to *accent* the depth of the depression, where these four leaves come together. The small *eye* between these leaves, at the bottom of them, as well as the kind of cup in which this central form is set, will require the use of small tools to clear out and obtain the necessary sharpness. As before stated, model with the fingers, and only use the tools where the fingers are too large for the purpose, or where great sharpness is required.

## EXERCISE III.

FIG. XIV.



In this exercise will be found a complete change of subject. The three leaves are simply a reproduction of a bit of natural foliage, and are not treated ornamentally. The two former studies were conventional designs for architectural decoration. Place the cast No.  $\frac{2315}{4}$  in a similar position to that described before, and make a sketch on the slate of the general outline. Faults in the drawing will not strike as forcibly in this subject as

in the previous—and this is a disadvantage in this class of subject. The more plainly the faults can be impressed on the eye of the student, the better for his progress, and it will, therefore, be necessary to exercise care in this that it be not drawn in a slipshod manner.

Study very carefully the relation of the various points to each other ; note that *a* is slightly higher towards the top of the cast than *b*, and that *a* is more to the right hand than *c*, trying at the same time to estimate the amount of the variations. When they *have been determined*, verify their accuracy by means of the compass.

It will be found convenient to mark the points where the ribs join the leaf stalk, noting the triangle formed by these points in the three leaves, *d*, *d*, *d*. A similar triangle marked on the slate gives a good starting point. The *imaginary* straight lines forming the sides of the triangle in the cast, and those marked on the slate, will lean exactly the same, if the result be correct, as any student, who has been well taught freehand drawing, will know. Assuming that the three points are correct, next draw the lines of the ribs, taking care to give these lines also their correct inclination, and determine their lengths. When this is accomplished there will be little trouble in completing the drawing.

In building up the clay only small quantities will be required at a time, as the projection above the background in many parts is only very slight. Press down the clay very firmly, and cultivate the power of *drawing* the forms with the thumb. At the same time it will be necessary to employ the tool at an earlier stage than in the previous studies, as such openings as those as *e*, *e*, *e*, are too small for the fingers. These must be kept clean and partly modelled by means of

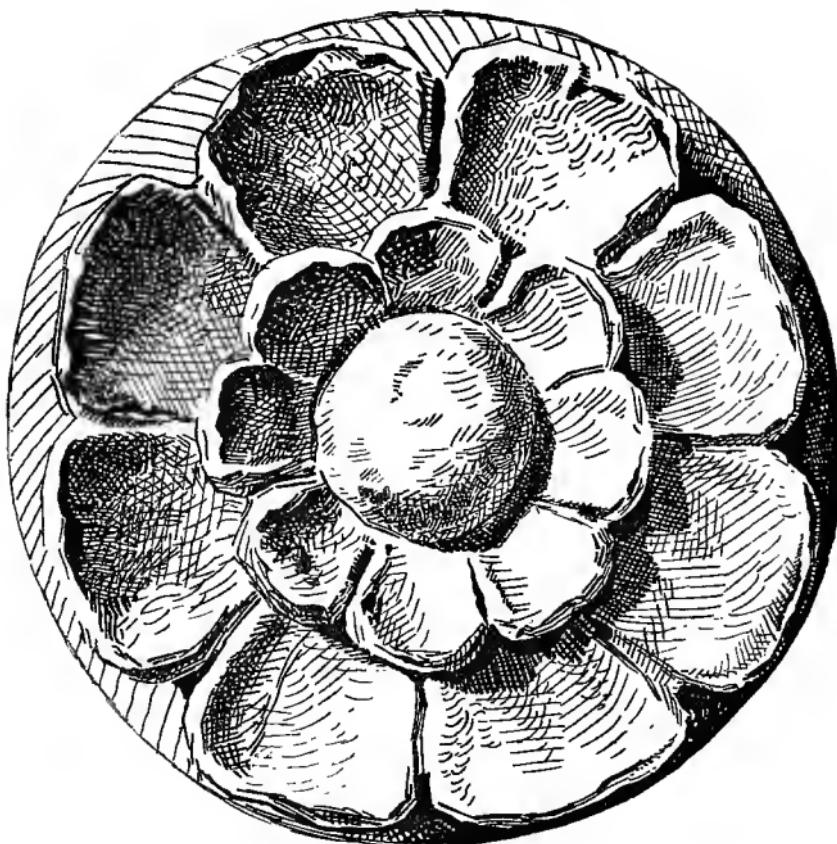
tools. The student will soon acquire the habit of selecting the tools that look most convenient for the purpose, either round ends or sharp points, little knobs or serrated ends, as the requirements of the case may suggest. The stems will also necessitate the use of tools to maintain the clean soft outline on the background. Pay attention to the delicate and undulating modelling on the surface of the leaves and the varying relief at their edges. Notice also that the edges are sometimes round, and at other times nearly square, and in some places die almost into the ground.

In finishing this model a small tool must be used to secure the delicacy of the fine detail, such as the fine veins which radiate from the stalk in each leaf, and the small markings on the stems. In the same way give the crispness at *f*, *f*, and similar points. The *undercutting* of those portions which are most in relief should now be obtained by means of one of the larger flat tools. It is better to cut this away at the last, and not to model it, so that a better support may be obtained while modelling the surface.

The effect of the undercutting should be observed. By preventing the thickness of the clay being visible, the idea of that part of the leaf being detached from the background is better conveyed. In confirmation of this note the difference in effect before and after doing the undercutting. By study of this kind the student is not only learning to model from a simple cast, but is acquiring also a knowledge of the elements of original expression.

## EXERCISE IV.

FIG. XV.



The example selected for this lesson is No. 182 on Messrs. Brucciani & Co.'s list. It is a rosette, like that of the second exercise, but there is much more modelling in it. The previous study was simple and mechanical in character, while this has much variety of modelling on the surfaces and the edges of the petals.

Place the model in the usual position, and draw upon the slate the general outline. Commence by drawing a circle to enclose the whole figure, and mark the centre of this circle. Draw horizontal and vertical diameters. Divide the quarter circles into half, and draw two other diameters, which will give the positions of the eight outer petals. Next draw a concentric circle for the centre of the flower, and another one as the boundary of the inner row of petals. The dividing lines of these latter petals will be obtained in the same manner as the outer ones, taking care to place the diameters *not* on the previous ones, but exactly midway between them. Having obtained the main positions, no further drawing will be of service.

By this time the method of applying the clay should be well understood, but it cannot be too often impressed on the student that it is most important that the clay be well pressed down and made thoroughly solid. The eye should also be trained to estimate the amount of clay necessary to bring up a form to the point required, and then this quantity should be taken and stuck on in the proper position. Remember that scraping off as a rule means an error in putting too much on.

Again, although the student *must* at this stage work from the cast, frequent reference should be made to the illustration, so that a greater appreciation of what is intended in the drawing may be acquired. In this way the student will cultivate the power of understanding a drawing, and when, in more advanced study, he commences to model from the flat, it will not come upon him in all the novelty of a new departure.

In completing the modelling of the subject in hand, great

attention must be paid to the varieties of surface on the petals. Give the irregularities—the small lumps, the slight depressions and the undulating surfaces. True, many of these are due to the age of the original from which the cast is taken, but as an exercise in modelling these subtleties must be observed. A tool will be necessary to complete the modelling between the petals and round the central form, and in those places where a little sharpness is required.

Finally, cut away round both rings of petals to produce the necessary undercutting.

## EXERCISE V.

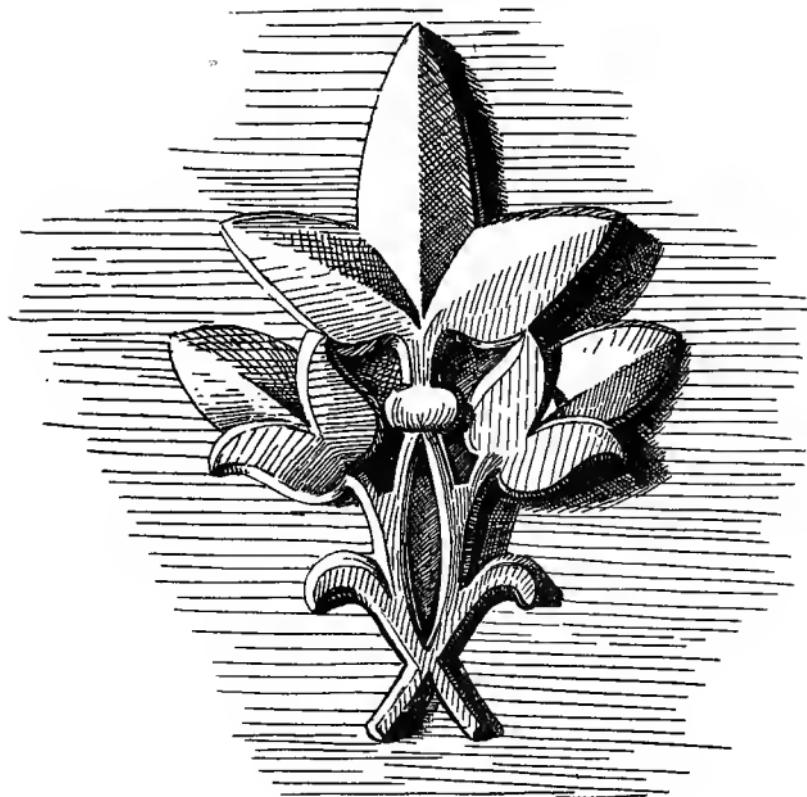


FIG. XVI.

Although in many respects Fig. XVI. is much more simple in modelling than the last, it is introduced here as affording an elementary example of bi-symmetrical ornament, that is, ornament designed with the two sides alike. It is No.  $\frac{2315}{5}$ . Commence the drawing on the slate with a straight line down the centre, and proceed as in the usual *freehand*

copies, to an elementary one of which this bears such a pronounced family likeness.

Build up the clay as usual, giving to the various parts their proper projection. It will, no doubt, become apparent very quickly why it is more simple than the last. It will be observed that there is very little modelling on the surfaces, and no subtleties at all. At the same time many of the angles are so sharp that more work than usual will be done by the tool. In fact, the student must be on his guard not to be tempted to use the tool very largely indeed in this particular example. The thicknesses will necessarily be finished with the tool, and if the larger surfaces be not *flat* enough, one of the boxwood tools with fine teeth may be employed and the surface scraped down, the serrations afterwards being pressed out by the thumb. There is no undercutting. No further instructions should be necessary on this subject.

## EXERCISE VI.

FIG. XVII.

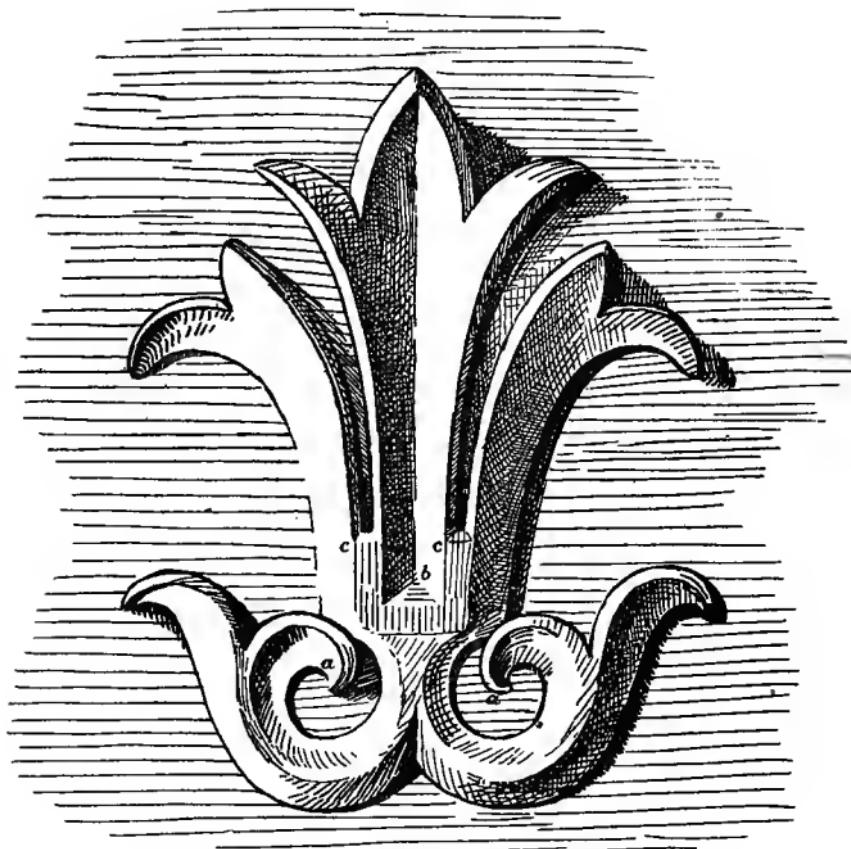


Fig. XVII. is another piece of bi-symmetrical ornament, but is more difficult than the last. It is No.  $\frac{2315}{6}$ . It appears unnecessary to give any instructions in drawing the general outline, but at the same time it must not be inferred that the outline is not to be troubled about.

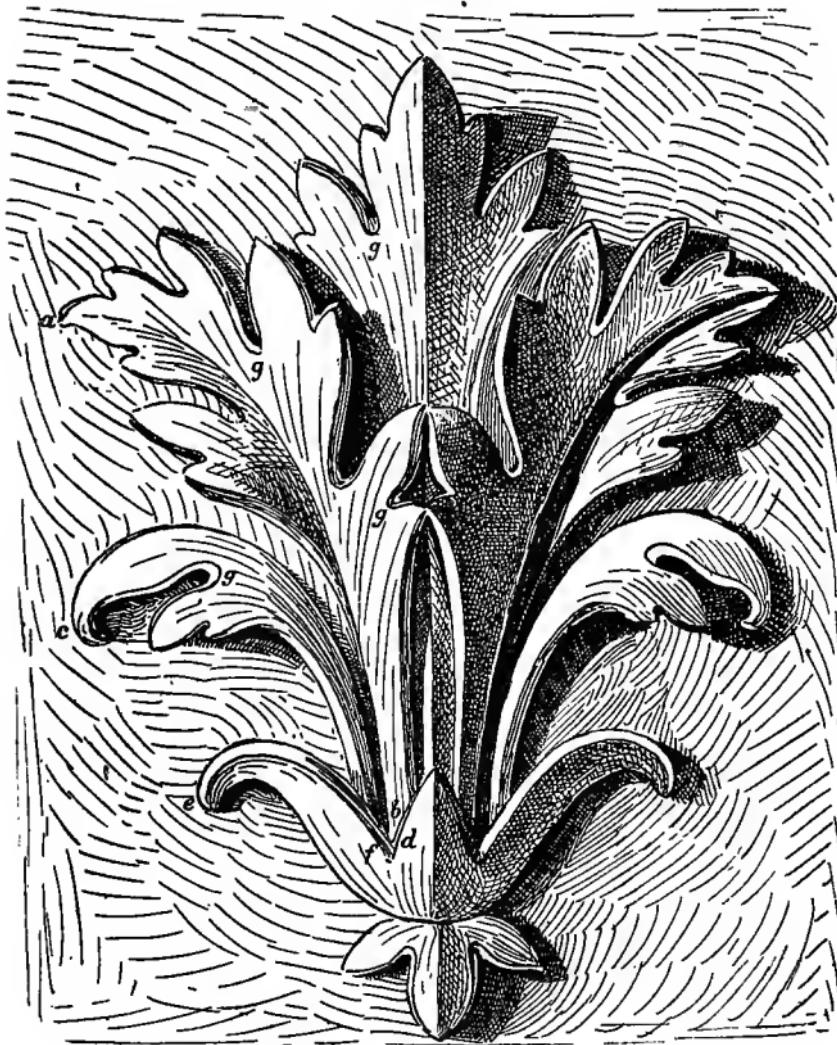
It must be absolutely correct in proportion, with the main lines properly expressed, but anything further than that is useless.

Build up the clay in the usual way, paying great attention to the two forms at the bottom of the cast, as these are the most difficult to describe. It will be noticed that the portion of this lower form, which turns towards the centre at *a a*, has somewhat the character of the "*volute*." The "*squareness*" at *b* and *c c* can only be given by using the tool ; in fact, this model, like the last one, will require rather a liberal use of the tools to obtain the flatness and sharpness of the cast. There is little undercutting in this example.

Although no reference has been made in the later lessons to leaving the work incomplete, wrapped up in damp cloths, it is not assumed that the modelling will be completed in one lesson. In fact the work may be discontinued at any moment, by taking the precautions, previously explained, to prevent the clay drying.

## EXERCISE VII.

FIG. XVIII.



This example gives a small piece of serrated foliage, an introduction to a large class used in ornament, and known under the general name, "*Acanthus*." Although this piece has *not* some of the characteristics of *Acanthus*, still,

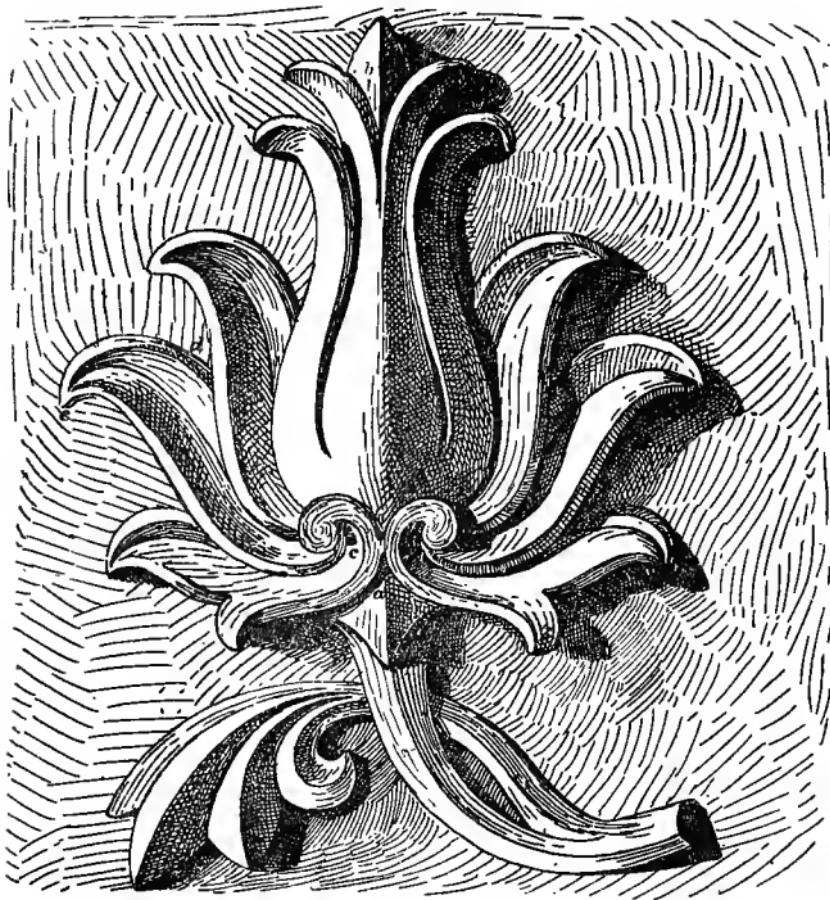
the serrations of the leaves, and the general radiation are valuable preparations at this stage of the study. It is No.  $\frac{2615}{1}$ . Draw the main lines, taking care that the general proportions and the radiating lines, such as *a*, *b*, *c*, *d*, *e*, *f*, are correctly given. It is assumed that the student is familiar with the best method of drawing the leaves, that is, by first blocking out the general masses, and afterwards cutting up the serrations.

Commence to build up the clay as before, using smaller pieces to model up the various lobes formed between the serrations. Do not be tempted, however small, to "*cut*" any of these out with the tool, like carving. The tool must only be used to model the edges or accent the junction of the sides of the serrations, *g*, *g*, all of which block in with the fingers. Notice that as portions of the leaves turn over, these parts have a tendency to recede towards the background again, and that this assists in giving a flexible look to the leaf.

The thicknesses of the leaves will require the use of tools, and many parts near the centre can only be made sufficiently sharp in the same manner. Observe that, as a rule, the curves forming two sides of the serrations are not identical, the one being rounder where the other is straighter or flatter. Notice also, in finishing, that the central line is perfectly upright throughout, and that on the various parts the portions fall exactly under each other. Complete by cutting away, where required, for the undercutting, and model up sharply and neatly on all edges requiring to be so, but do not exaggerate in this respect, or great hardness will result. It will be seen, on reference to the cast, that the edges are not absolutely keen.

## EXERCISE VIII.

FIG. XIX



This subject, No.  $\frac{2315}{3}$ , is more complex in form than the preceding ones. It will be convenient to model it larger than the cast. Callipers of the pattern given in Fig. V. may be used. As already explained, these have a movable centre, *a*. As this centre is moved more

to the right, the distance,  $b$ ,  $b$ , increases in proportion to that at  $c$ ,  $c$ . With the centre set at about the same point as it is in Fig. V., it will give a suitable enlargement for the present study. Make an outline drawing on the slate as before, measuring from the cast between  $e$  and  $c$ , and using the other end,  $b$ ,  $b$ , for the measurements on the drawing. Of course it will be understood that when once the centre of the callipers has been fixed, it will not be again moved in that drawing. All that is required to have the parts enlarged in equal proportion is to measure the cast with one end, and mark the drawing with the other.

Draw a vertical straight line through the centre and mark upon it the points  $a$  and  $b$ , using the callipers as described. Next draw the central form, and afterwards the midrib of the three leaves on either side, noting that the lower one lies practically in a horizontal position. It is assumed that the student will find no difficulty in completing the drawing.

In building up the model in clay, endeavour to bring up the different forms to their proper projection, by small bits of clay stuck on, and to draw *delicately* and with *feeling*, the different contours and surfaces. If the student be working without a teacher, he must most carefully compare his own work with the cast, and never rest satisfied until he can see no difference between the two. Slovenly work and impatience to get to the next study will only end in failure.

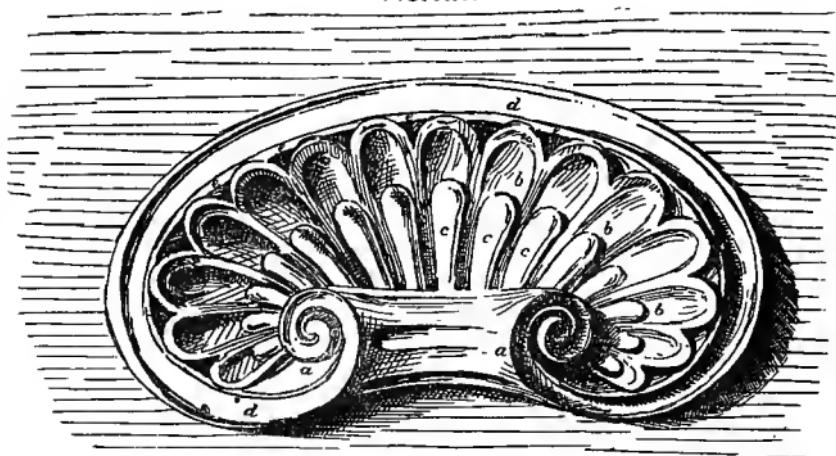
This example will, like some of the previous ones, require the use of the tools to some extent. The drawing of the outlines and the midribs is so sharp that a tool must be used. If any of the hollowed surfaces have become lumpy, they may be corrected by scraping with a boxwood tool that has fine teeth, and may then be finished with the thumb and

tools that go into the corners, or which lend themselves to modelling—the lesser surfaces may be pressed into service.

Examine very critically this cast in profile, and note the great variety in projection. For instance, *c c* varies throughout its entire length, while *c d* is entirely different again. The same applies to all the leaves. In fact, this characteristic marks a distinct difference between the present subject and those gone before, and necessitates a more constant reference to the profile.

#### EXERCISE IX.

FIG. XX.



The present exercise (Fig. XX.), terminates the portion required for the elementary or second grade modelling examination of the Science and Art Department. If the work so far has been very carefully done, the student

should be able to pass the examination, but if more practice is deemed necessary, any other simple casts of a similar character may be used as copies, or the student might work some of the following exercises, although they are of a more advanced nature.

The present example is No.  $\frac{1815}{7}$ . It will require care in drawing. Some parts of it will be useless to draw at all, as they are oblique to the ground, such as the volutes at *a*, *a*. The general shell form, however, should be drawn, and the radiating divisions marked out.

Build up this form in clay, and gradually bring up the “*fluted*” portion *b*, *b*, but do not pay any attention to the parts *c*, *c*, continuing the “*flute*” under those forms.

Pay great attention to the volute, at *a*, *a*. It is a test of good drawing or modelling to describe this form well. The tool will be required to neatly form the depression *d*, *d*, springing from the volute and passing round the shell.

The hollows between the curves of the volute will require a finely-pointed tool, to form them neatly and sharply.

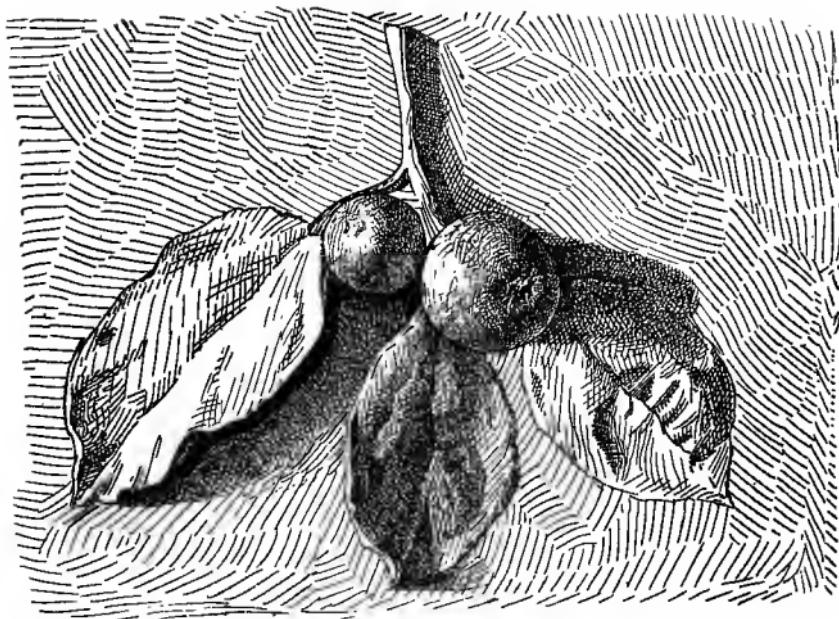
The same will apply at the corners formed at *c*, *c*.

The forms *c*, *c*, *c*, may be rolled up in clay, on a board or slate and then laid in the “*flutes*” in the exact positions required. They must be pressed carefully down, and finished with a fine tool, drawing neatly and carefully the lines between them and the flutes, and also finishing accurately the rounded ends. No special instruction is required. It is simply a question of modelling neatly in the manner repeatedly explained.

## CHAPTER V.

## EXERCISE X.

FIG. XXI.



This exercise gives a complete change in the form of study. The cast selected is No. 2110, and is simply a cast of fruit direct from nature.

The student may also desire to try one of the other modelling materials, say *Pâte Plastique*.

Either this material or wax will require no damping, and may be preserved, when completed, without further attention.

If it be desired to retain it, it will be best to model it on a small piece of board the size of the cast. Fix this board on the modelling board in a convenient position for the work, and having drawn the general outline as usual, drive into the board some small tin tacks *inside* the outline of the various forms. These are to assist in firmly attaching the wax to the board, and must be driven so far into the board that the head of the tack will be well buried in the wax. If the head came to the surface it would ruin the modelling of that part. Where the apples are the tack may stand up a considerable height, and also in the raised parts of the leaves, while in those parts with little projection no tacks at all should be used.

To get the wax into working condition it should be slightly warmed, but only sufficiently to give it a plastic feeling, about the same as workable clay, with which the student is already familiar. Any melting would make it as unmanageable as clay deluged with water. Apply the wax in exactly the same manner as clay. All the instructions previously given will apply with equal force.

The wax must be built up bit by bit, and firmly pressed down, using the fingers as before. Model all the large forms first, and give no attention to the minute details. It will be better to leave the large apple till the leaves and small apple are far advanced, as it will be more convenient to get at the leaves with the large apple out of the way. There is much delicate modelling required to describe the variety of surface in the leaves and of the serrated edges. This assists in conveying an idea of the *texture* of the

leaves, and of contrasting them with the solid and less yielding nature of the apples themselves.

The large apple being quite in the *round* may be partly modelled separately, and attached by a nail, or it can be fastened on by means of the large tack already driven in. Under any circumstances, the modelling of the apple must be completed after it is firmly fixed in position. Study carefully the slight taper towards the eye of the apple and the delicate flattening into quarters. Also note the kind of little pucker that occurs all round the insertion of the eye.

Render these with all the feeling possible, and remember that these are the refinements that lift it from the commonplace.

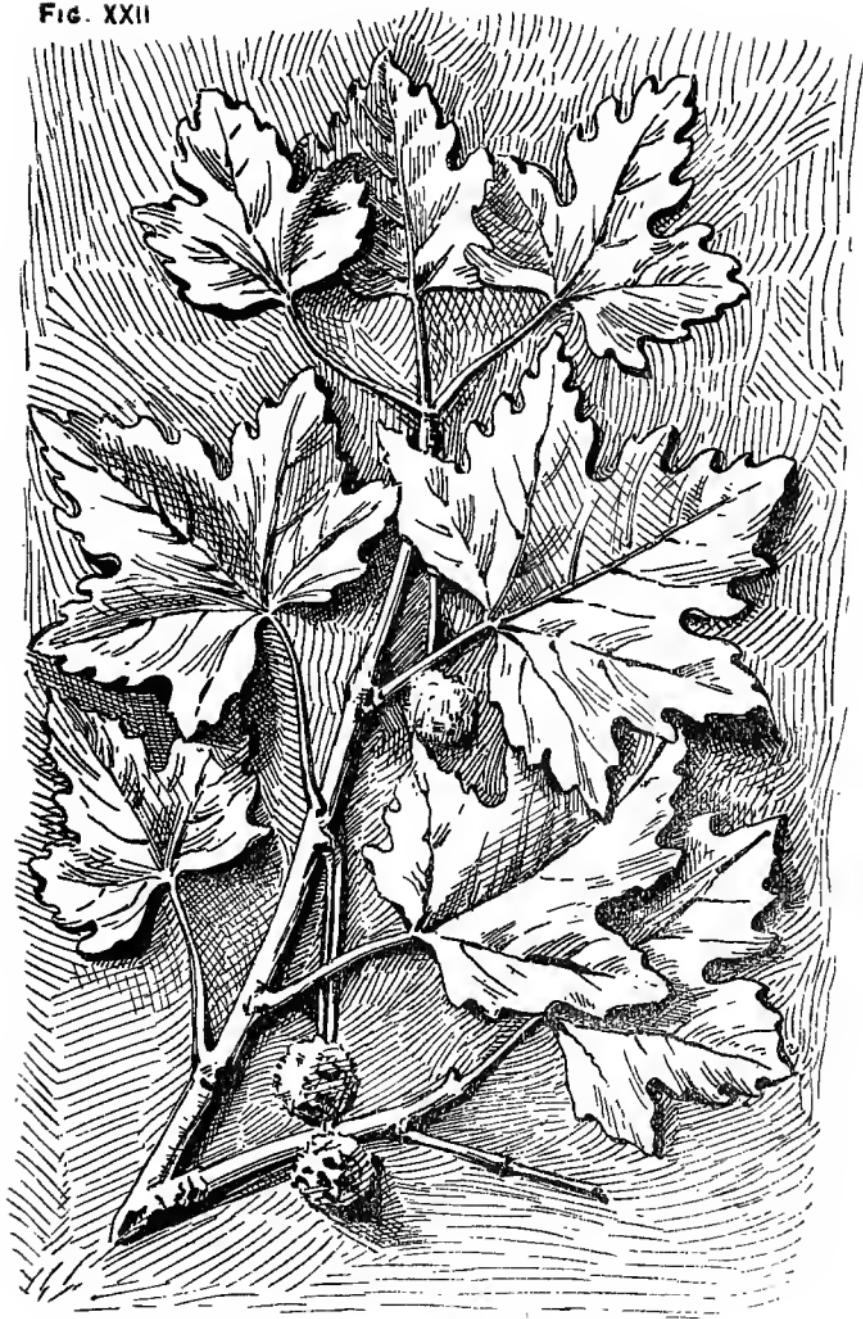
If at any time during the progress of the work the wax becomes too hard, it can be softened by placing it near the fire, taking care not to put it so near as to soften it much. Warm fingers alone will often do all that is wanted.

When this model is complete, it will be interesting to try some similar subject direct from nature.

Any simple fruit and two or three leaves on a branch will make a good subject, and will probably give increased interest to the study.

The great disadvantage of working from nature is the perishable character of the model, while in the case of a plaster cast it remains indefinitely unchanged. Still, as the student feels his power increasing, he should place himself face to face with nature, to whom he must look as the highest teacher.

FIG. XXII



## EXERCISE XI.

The model in the case of Fig. XXII. is a simple cast from nature, and is selected as affording an example of the way the student is recommended to work from natural objects. It is No. 2548. It would be necessary to model and complete one leaf at a time in working from nature, as otherwise the change in form would be too rapid to permit of any real effort at reproducing exactly that which was before the student at the moment, a method of study which is essential to success.

In the cast, of course, these difficulties would not arise, and it may be drawn complete in outline on the slate or modelling board.

In this example the greater part is in *low relief*, and will require little clay or wax. It should be placed in a strong side light, so that the delicate modelling on the surface of the leaves may be more readily observed. This delicate modelling constitutes the great difficulty of this study, and lifts it into much more complete work than those studies which have gone before. In the small details the *tool* will have to be much used, but all the general modelling, even the delicate varieties on the surface of the leaves must be first given by the thumb. Next take a small tool and carefully model the veins. Also draw the edges of the leaves, giving a sharp crisp character to describe the thinness of the leaf.

The junction of the leaf stalk with the stem must be well modelled. There is much drawing in this part, and the

manner in which the stalk fits round the stem, sitting somewhat as it were on a saddle, must be carefully described.

This part of the subject, in working from nature, will always require much care, and the manner in which the stalk springs, either *opposite* or *alternate*, must be truly rendered, as those acquainted with botany will fully realize. Often the stem enlarges a little at the leaf stalk, as in the present subject, and in the *axile* a small bud may be visible.

At this stage of the study the student should possess a considerable control over the modelling material, the principal need now being a further cultivation of the power of observation.

In finishing this study endeavour to give any special character to the surface such as is found on the fruit. Sometimes this may be done by pressing down another substance on the clay, such as a worn brush with many of the bristles gone, but this must be resorted to with care, and only when the roughness is *too small* to model in detail. At other times a tool with teeth in it may be *scraped* over the surface in *one* direction, or *crossed*, and these lines may be left or partly obliterated by the thumb. Here the judgment and taste of the artist must be his guide.

So far the backgrounds have not been dealt with, but the slate or board have been allowed to represent this part of the subject. When the background is smooth with no *character* in it, this is all that is necessary, and in casting in plaster the slate, especially, will be found to afford facilities in moulding, as will be explained in a later portion of this work. But when there is any modelling on the background, or it is necessary to give a different texture to it as compared with the object upon it, then the slate must be covered with

a thin layer of the clay at the commencement of the work. When this is the case, take a tool with a sharp point and draw the outline by *incising* or *scratching* the clay; as, of course, in this instance a pencil could not be used. After that the clay is built up in the usual manner. Any inequalities or varieties of surface on the background can then be given. In some subjects a few *scratches* with the teeth of a *tool*, and perhaps then partly obliterated with the thumb will give these an effective background, contrasting pleasantly with the smoother forms of the object.

## CHAPTER VI.

## EXERCISE XII.

WITH this exercise commences the study of the figure, a much more difficult subject to deal with either in drawing or modelling, and one that should not be attempted till a very fair mastery has been obtained over the material and the representation of ornamental or vegetable forms. The model selected is the mask of the well known figure of Moses, by Michael Angelo, and is a capital subject for the purpose, as the forms are large and comparatively simple.

It should be modelled not less than two-thirds the size of the cast, which is No. 461. It will be better to model on a board, and to drive in nails to assist in holding the clay, as was explained in the case of the apples.

The drawing will only be useful to secure the general proportions and positions. Damp the board and commence to build up the clay exactly in the same way as usual, constantly referring to the profile to test the amount of projection in front. Build up the thick parts first, and *draw* down to those with less projection. Endeavour to judge the amount of clay wanted to raise each part of the surface modelling, and then, taking the *small* quantity required, draw the form complete with the *thumb* at once. In this study *no* tools



FIG. XXIII.

must be used on the flesh except to obtain the *sharp* lines about the eyes and mouth. The character of the beard and hair is best obtained by very thin layers of clay coming on at the last, and expertly modelling them by the thumb without softening away too much. In some places the tool with fine teeth will be of service on these latter surfaces, but great judgment must be used, as hair should *never* be represented in sculpture except as very broadly *massed*.

The skill of the student will be tested by the refinements of the modelling, and the accurate description of the *texture* of the flesh, as contrasted with that of the hair.

In all the exercises, the student should have noticed what the form in the cast is that the drawing expresses. In this way he becomes gradually trained to realize in the *round* that which is merely illustrated in the *flat*, and so prepares himself for modelling from drawings or photographs.

#### EXERCISE XIV.

For this exercise Fig. XXIV. is selected a medallion of a profile head in low relief. It is No. 2,683.

It will be best modelled on a board. Damp the board, and place a thin layer of clay upon it. Upon this *incise* or *scratch* the outline of the subject. There is much refinement in the contours of the face, which must be drawn with accuracy. It is assumed that the student, at this stage, will have acquired some knowledge of figure drawing, and be acquainted with the standard proportions. He will then have small difficulty in drawing the head before him. One fault,

FIG. XXIV.



which constantly arises, however, and against which he should be on his guard, is placing the eye too high in the head. It is on a level, at about its centre, with a line passing midway between the bottom of the chin and the crown of the head. The mouth is so placed, that the bottom of the under lip is about half way between the nose and the bottom of the chin. When the outline is drawn, drive in a few tacks, in various positions inside the outline, as explained in a previous lesson. These should be in the portions where the clay is thickest, and their heads must be kept well below what will be the finished level of the work. Next build up the clay round and over the tacks, their use being simply to hold the clay firmly on the board.

This subject will require *building up* very carefully, as there is great variety in the various levels. A constant reference must be made to the side view, to observe this difference, and the cast must be placed in a very strong *side light*, to enable the student to see the subtleties of modelling.

The surfaces in this example afford much scope for the practice of the essential to successful modelling, viz., the accurate drawing of thin films of clay, as they are applied to the form. No doubt tools will have to be used on the surface, and for this the serrated tool will be useful. Scrape away any part which requires to be lowered, and then model, that is *draw*, again with the thumb. A small flat-pointed tool will be required to get the detail of the eye, nose, mouth, and ear, but even in these do not keep the edges *absolutely keen*.

The flesh must be modelled *smoothly*, great care being taken while doing so, not to lose the *drawing* of the surface forms, a danger which, if not avoided, would be disastrous, and result in that *dumpling like* appearance, so characteristic

of the work of the *novice*. The *texture* of the flesh secured in the manner described, the hair will require a broader and lighter treatment, such as was practised on the mask of Moses. Observe how, in many places, the outline of the hair *dies* into the background, and on to the forehead. This helps to suggest the light character of the hair, and added to the less "smoothed" application of the clay will give the requisite texture. The drapery must be rather less smoothly modelled than the flesh, but more so than the hair. In the drapery great attention must be paid to the folds—their *smallness*, *thinness*, and manner of *breaking* being the principal means of describing the character of the material. In describing texture, the sculptor has not as many resources as the painter, and, consequently, the utmost must be made of those available.

It will tax all the powers of the student to model this subject; in fact, to render it well requires considerable skill, but it is assumed that those in earnest will have executed many more models than those given in this book. These lessons are intended to explain fully the method of study, and to show the course that should be followed. At the same time, it is useless to multiply examples, when nothing new could be added to the instructions, and all that is required is further practice, and increased power on the part of the student.

The additional examples selected for study should be somewhat similar to those given, so that they may follow in a consistent course.



FIG. XXV.

## EXERCISE XV.

In this exercise, Fig. XXV. and XXVI., the student will meet with the first example completely in the round, that is, without a background. It is the bust of Diomedé, and is No. 457.

Model this bust on a stand similar to the one illustrated in Fig. *b c*, as the clay will require a support. Build up the clay from the bottom, pressing it down *very firmly indeed*, but not coming up to the surface. Follow on with the shoulders, building up a good solid mass; but keeping well within the contours, say, not more than eight inches across. At this stage it will be best to leave it, for a day, at least, so that the clay may settle down and become a little harder.

No modelling of the forms should be done at present to this lower portion, the clay merely forming a pedestal or support to the head.

In these busts, when the head is very much inclined in any direction, the *upright support* on the modelling stand might not be practicable, in consequence of it not being buried beneath the surface. In these cases it will be necessary to fix an inclined support, but it must be *securely* fixed so that no movement is possible, or it will be worse than useless. Build up masses of clay for the neck and head, pressing down solid, but keeping well within the contours.

This mass of clay should harden somewhat to avoid *sinking* when the work is more complete.

Measure carefully to ensure the height from the base being accurate. The modelling is advanced in a similar manner



FIG. XXVI

to that previously described, the only difference being in having to work *all round* it. The stand must be gradually turned round, and the *pose* most carefully studied. Secure first the *general proportions*, and then the *action*, before going further. Note the elevation of the chin, with the forehead thrown backwards, as assisting the expression of looking upwards. This will be observed best in the profile. In full face will be seen the inclination of the head towards the left shoulder of the model.

All this must be secured in the mass, before the *details* are dealt with. Beyond these points the modelling presents no more difficulty than the previous exercise.

The forms should be carefully rendered, and the different textures of flesh and hair described.

When these are considered satisfactory, model the lower part of the neck and chest, and complete the pedestal.

CHAPTER VII.

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## MOULDING AND CASTING.

**A**S already explained, clay cannot be kept permanently in its natural form, and, consequently, from the model is obtained a cast in *Plaster-of-Paris*, by the following process.

First, make the mould, which may be of Plaster-of-Paris or other suitable material.

*Plaster-of-Paris* is made from gypsum, burnt in ovens, and afterwards reduced in a mill to fine powder. There are several qualities, but only the *fine* is suitable for this work. The plaster must be mixed with water to the consistency of cream. Experience will soon teach when the right proportion is employed.

In mixing, never pour the water into the plaster, but place the water in a tin can or other suitable vessel, and, stirring the water all the time, drop the plaster gradually into the water.

After it reaches the right consistency it very quickly thickens, and will *set* in less than half an hour.

To mould one of the simple subjects such as that illustrated in Fig. XIV., place a wall of modelling clay round the model on the slate, leaving sufficient of the slate exposed

to represent the slab upon which the leaves are laid. This wall of clay should stand up fully half an inch above the highest point of the model, and must be pressed very firmly down on the slate with the sides and inside corners smooth and upright.

Keep the slate in a perfectly level position, and with a *large* spoon or spatula pour plaster, mixed as directed, into the space contained within the clay walls, covering the whole of the clay model. Be careful while doing this that no air bubbles form in the wet plaster. If such should be seen, push a small stick into them and let the air out. Continue to pour in plaster till the portion within the walls of clay is level full, that is, till there is half an inch of plaster about the highest point of the model.

Before pouring in the plaster a little oil or *moulding composition* may be brushed round the inside of the walls and on the ground to facilitate the removal of the *mould*. A little ochre in dry powder is often mixed in the plaster to turn the *mould* yellow, so that it may be readily distinguished from the cast.

After the plaster has been poured on, leave it to set well, say, for two or three hours at least. After this, break down the clay walls and lift up the plaster mould. If there be no *undercutting*, and if the model have only a moderate projection, the mould will come away and show the exact reverse of the model. If there be a *little* undercutting it can be filled in on the model with clay till the edges are vertical, when the mould will *draw* as before. Afterwards in the plaster, the required undercutting is done again, by means of a sharp steel tool, in this case actually *carving* with the tool. After the mould has been removed from the model,

pick out any clay that may remain in it, and soak it in a pan of water for a few minutes. With a *soft* brush remove any film of clay that may still adhere, but be very careful not to scratch or wear away any of the finer parts.

The *mould* is now complete, and ready for taking the cast.

Place the *mould* level on a table, with the face up. When examined it should be found *shining with moisture*, but *without* any water lying in the mould.

Mix the plaster as before, and place some of it in the mould by means of the spatula. Then rock the mould, so as to ensure the plaster running into all the little hollows, and afterwards pour in more plaster, and fill up the mould.

It must now be left for an hour or two to *set* well, after which turn it over, and commence to *break* off the mould, which, of course, will be destroyed in the process—hence the name given to this method—*waste moulding*.

A small *mallet* and one or two *unground* carpenter's chisels will be required to remove the mould. Exercise great care, and do not forget that the *mould* has to be broken, while the *cast* is kept absolutely uninjured. The advantage of having the mould *coloured*, while the cast is *white*, will now be apparent. After a small portion of the mould has been removed, the cast can be readily drawn out, if the student will only remember that the plaster is exceedingly brittle, and absolutely unyielding, and treat it accordingly.

To obtain numerous casts from the same *mould* necessitates a process called *piece moulding*, but that is beyond the scope of this work.

When the cast has become *thoroughly* dry, it may be painted, to imitate various kinds of bronze or terra-cotta.

When the clay with which the modelling was executed is of a suitable character, instead of casting, the model itself may be *burnt*, becoming what is termed "Terra-Cotta." Its colour will be "red" or "yellow," according to the clay used. If intended to be "fired," no wood or iron must be employed for internal supports, and any of the small reliefs, which were simply modelled on the slate for casting purposes, must have a clay background provided for them.

In modelling for Terra-Cotta, it is necessary to work much larger than is required, as in "firing." the shrinkage is considerable, in some clays amounting to about one-third of the size.

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